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This index covers all technical items — papers, correspondence, reviews, etc. — that appeared in this periodical during 1993, and items from previous years that were commented upon or corrected in 1993.

The Author Index contains the primary entry for each item, listed under the first author's name, and cross-references from all coauthors. The Subject Index contains several entries for each item under appropriate subject headings, and subject cross-references.

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Gatherer, Alan, and Teresa H.-Y. Meng. A robust adaptive parallel DFE using extended LMS (Corresp.); *T-SP Feb 93* 1000-1005
Ge, Hongya, and Donald W. Tufts. Estimating the frequencies of two sinusoids using only the phase angles of complex-valued data (Corresp.); *T-SP May 93* 1982-1986
Gelabert, Pedro R., and Thomas P. Barnwell, III. Optimal automatic periodic multiprocessor scheduler for fully specified flow graphs; *T-SP Feb 93* 858-888
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Kovacevic, Jelena, and Martin Vetterli. Perfect reconstruction filter banks with rational sampling factors; *T-SP Jun 93* 2047-2066

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Lee, Harry, and Fu Li. Quantification of the difference between detection and resolution thresholds for multiple closely spaced emitters (Corresp.); *T-SP Jun 93* 2274-2277

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Li, Welping. On vector transformation; *T-SP Nov 93* 3114-3126

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Lu, Chao, James W. Cooley, and Richard Tolimieri. FFT algorithms for prime transform sizes and their implementations on VAX, IBM3090VF, and IBM RS/6000; *T-SP Feb 93* 638-648

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Lun, Daniel Pak-Kong, and Wan-Chi Siu. An analysis for the realization of an in-place and in-order prime factor algorithm; *T-SP Jul 93* 2362-2370

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Mahon, Mark P., Leon H. Sibul, and Hector M. Valenzuela. A sliding window update for the basis matrix of the *QR* decomposition (Corresp.); *T-SP May 93* 1951-1953

Mallat, Stéphane G., and Zhifeng Zhang. Matching pursuits with time–frequency dictionaries; *T-SP Dec 93* 3397-3415

Mao, M., and Z. J. Gan. Statistical analysis for the convergence rate of signals to median filter roots (Corresp.); *T-SP Jul 93* 2499-2502
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McHale, T. J., and G. F. Boudreaux-Bartels. An algorithm for synthesizing signals from partial time–frequency models using the cross Wigner distribution (Corresp.); *T-SP May 93* 1986-1990
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Bibliographies

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+ Check author entry for coauthors

† Check author entry for subsequent corrections/comments

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+ Check author entry for coauthors

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+ Check author entry for coauthors

‡† Check author entry for subsequent corrections/comments

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using recursive IIR orthogonal filter banks to derive continuous time bases of wavelets. *Herley, Cormac, + , T-SP Aug 93* 2536-2556
using wavelet-based multiband dynamic range compression to compensate for recruitment-of-loudness hearing impairment. *Drake, Laura A., + , T-SP Dec 93* 3306-3312
wavelet magnitude analysis theorem. *Anderson, James C., T-SP Dec 93* 3541-3543
wavelets and signal processing (special issue). *T-SP Dec 93* 3213-3535
Zak transform and sampling theorems for wavelet subspaces. *Janssen, Augustus J. E. M., T-SP Dec 93* 3360-3364

Wiener filtering
Wiener filter realization for target detection using group delay statistics. *Li, Xing, + , T-SP Jun 93* 2067-2074

Wiener–Hopf theory
generalized feedforward filters, class of adaptive IIR filters with restricted feedback offering attractive properties of FIR filters; results for gamma filter version. *Principe, Jose C., + , T-SP Feb 93* 649-656

Wigner distributions
algorithm for synthesizing signals from partial time–frequency models using cross-Wigner distribution. *McHale, T. J., + , T-SP May 93* 1986-1990
analysis and filtering using optimally smoothed Wigner distribution; designing linear time-varying filter. *Bikdash, Marwan U., + , T-SP Apr 93* 1603-1617
application of LMS algorithm to smoothing pseudo-Wigner distribution. *Amin, Moeness G., + , T-SP Feb 93* 930-934
discrete time-and-frequency Wigner higher-order moment spectrum definition, properties, and computation; application to transient signal analysis. *Fonollosa, Javier R., + , T-SP Jan 93* 245-266
effect of noise on Wigner distribution of signals. *Stankovic, Ljubiša, + , T-SP Feb 93* 956-960
time–frequency design and processing of signals using smoothed Wigner distributions. *Krattenthaler, Werner, + , T-SP Jan 93* 278-287
tracking unknown nonstationary FM chirp signals using unsupervised clustering in Wigner distribution space. *Cohen, Fernand S., + , T-SP Nov 93* 3085-3101
use of cross-Wigner–Ville distribution for estimation of instantaneous frequency. *Boashash, Boualem, + , T-SP Mar 93* 1439-1445
Wigner distribution of linear signal space. *Hlawatsch, Franz, + , T-SP Mar 93* 1248-1258

Z

Zero-crossing problems; cf. Level-crossing problems
Zeros; cf. Poles and zeros; Polynomials